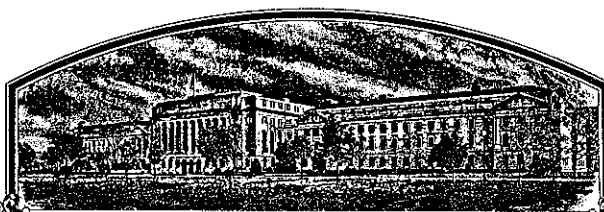


No.

8900132



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Pioneer Hi-Bred International, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

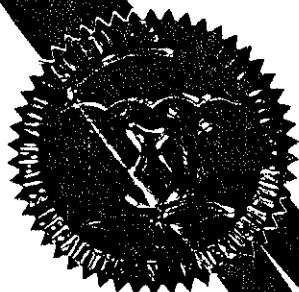
Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

ALFALFA

'5262'



In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D. C. this 30th day of March in the year of our Lord one thousand nine hundred and ninety.

Attest.

Kenneth H. Evans
Commissioner

Plant Variety Protection Office
Agricultural Marketing Service

Clayton Fetter
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

FORM APPROVED: OMB NO. 0681-0055

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

1. NAME OF APPLICANT(S) Pioneer Hi-Bred International, Inc.		2. TEMPORARY DESIGNATION XAF62	3. VARIETY NAME 5262
4. ADDRESS (Street and No. or R.F.D. No., City, State, and Zip Code) 7305 N. W. 62nd Avenue, P. O. Box 287 Johnston, IA 50131		5. PHONE (Include area code) 515-270-3340	FOR OFFICIAL USE ONLY VPPO NUMBER 8900132
6. GENUS AND SPECIES NAME <u>Medicago sativa</u>	7. FAMILY NAME (Botanical) Leguminosae		FILING DATE <u>Mar. 27, 1989</u> TIME <u>9:30</u> <input checked="" type="checkbox"/> A.M. <input type="checkbox"/> P.M.
8. KIND NAME Alfalfa	9. DATE OF DETERMINATION August, 1986		AMOUNT FOR FILING \$ <u>800.00</u> DATE <u>Mar. 27, 1989</u> AMOUNT FOR CERTIFICATE \$ <u>200.00</u> DATE <u>Mar. 26, 1990</u>
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) Corporation			FEES RECEIVED
11. IF INCORPORATED, GIVE STATE OF INCORPORATION Iowa			12. DATE OF INCORPORATION 1926
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS William T. W. Woodward, 7305 N. W. 62nd Avenue, P. O. Box 287, Johnston, IA, 50131 Jerry Chicoine, 700 Capital Square, 400 Locust Street, Des Moines, IA, 50309			

PHONE (Include area code):

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED

- a. ☒ Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.)
 b. ☒ Exhibit B, Novelty Statement.
 c. ☒ Exhibit C, Objective Description of Variety (Request form from Plant Variety Protection Office.)
 d. ☒ Exhibit D, Additional Description of Variety.
 e. ☒ Exhibit E, Statement of the Basis of Applicant's Ownership.

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act.)

☐ Yes (If "Yes," answer items 16 and 17 below)☒ No

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?

☒ Yes☐ No

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?

☒ Foundation☐ Registered☒ Certified

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?

☐ Yes (If "Yes," give date)☒ No

19. HAS THE VARIETY BEEN RELEASED, OFFERED FOR SALE, OR MARKETING IN THE U.S. OR OTHER COUNTRIES?

U. S. A. Spring of 1989

☒ Yes (If "Yes," give names of countries and dates)☐ No

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT

PIONEER HI-BRED INTERNATIONAL, INC.

DATE

3/23/89

SIGNATURE OF APPLICANT

BY: William T. W. Woodward

DATE

3/23/89

EXHIBIT A

ORIGIN AND BREEDING HISTORY OF THE VARIETY

'5262'

5262 is a synthetic variety comprised from 155 plants originating from experimental lines tracing to Saranac (18%), Vernal (13%), DuPuits, 530, Alfa (11% each), Flemish (9%), Titan, Valor, MnP-B1 (7% each), and Weevlc hek (6%). Parent plants were selected through phenotypic recurrent selection and trace to various experimental populations selected for one or more of the following: bacterial wilt, anthracnose, Phytophthora root rot, and winter survival.

Syn I seed harvested from parental plants in 1983 and 1984 in cage isolation was bulked and considered breeder seed.

During seed multiplication no variates beyond the limits defined under Exhibit C have been found. Multiplication procedures will insure that seed being sold as 5262 will not be shifted in characteristics beyond presently acceptable limits for alfalfa varieties.

It is confirmed that 5262 meets presently acceptable levels for uniformity for alfalfa varieties.

EXHIBIT B

NOVELTY STATEMENT

'5262'

5262 most closely resembles the variety '526'. 5262 differs from 526 in phytophthora resistance, being as resistant as 'Agate', while 526 has low resistance to the disease. 526 scores 8% resistant plants while 5262 scores 47.3% (Attachment I, Exhibit D).

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, MEAT, GRAIN & SEED DIVISION
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MARYLAND 20705

EXHIBIT
(Alfalfa)

OBJECTIVE DESCRIPTION OF VARIETY
ALFALFA (*Medicago sativa* sensu Gunn et al.)

NAME OF APPLICANT(S) Pioneer Hi-Bred International, Inc.	TEMPORARY DESIGNATION XAF62	VARIETY NAME 5262
ADDRESS (Street and No., or R.F.D. No., City, State, and Zip Code) 7305 N. W. 62nd Avenue P. O. Box 287 Johnston, IA 50131		FOR OFFICIAL USE ONLY VPVO NUMBER 8900132

PLEASE READ ALL INSTRUCTIONS CAREFULLY: Place numbers in the boxes to designate the expressions which are characteristic of the commercial generations of the application variety. Data for quantitative plant characters should be based on a minimum of 100 plants. Include leading zeros when necessary (e.g., 0 8 9) for quantitative data. Comparative data should be determined from varieties entered in the same trial. Plant color may be precisely designated by using any recognized color chart, e.g., The Munsell Plant Tissue Color Charts.

1. WINTERHARDINESS:

8 CLASS:

- | | |
|--|--------------------------------------|
| 1 = Very Non-Winterhardy (CUF 101) | 2 = Non-Winterhardy (Moapa 69) |
| 3 = Intermediately Non-Winterhardy (Mesilla) | 4 = Semi-Winterhardy (Lahontan) |
| 5 = (Du Puits) | 6 = Moderately Winterhardy (Saranac) |
| 7 = (Ranger) | 8 = Winterhardy (Vernal) |
| 9 = Extremely Winterhardy (Norseman) | |

TEST LOCATION: Owatonna, MN

2. FALL DORMANCY:

FALL DORMANCY (DETERMINED FROM SPACED PLANTINGS)

TESTING INSTITUTION AND LOCATION	DATE OF LAST CUT	DATE REGROWTH SCORED	REGROWTH SCORE OR AVERAGE HEIGHT				LSD .05
			APPLICATION VARIETY	CHECK VARIETIES*			
				Vernal	Ranger	Saranac	
Pioneer Hi-Bred Int'l, Inc	8/28/85	10/2/85	29.3	26.3	30.2	32.0	1.90
Owatonna, MN	9/4/84	10/2/84	7.9	7.9	8.6	9.1	.76
Pioneer Hi-Bred Int'l, Inc	9/25/86	10/16/86	13.0	11.0	-	19.0	4.70
Moses Lake, WA	9/15/86	10/16/86	16.0	13.0	-	22.0	4.80

* CUF 101, Moapa 69, Mesilla, Lahontan, Du Puits, Saranac, Ranger, Vernal, or Norseman as appropriate.

Specify scoring system used: Owatonna-average height in cm of space plants; Moses Lake-average height of plot in cm.

7

Fall Growth Habit (Determined from Fall Dormancy Trials)

- | | | |
|----------------------------|--------------------------|----------------------------|
| 1 = Erect (CUF 101) | 3 = Semi-erect (Mesilla) | 5 = Intermediate (Saranac) |
| 7 = Semidecumbent (Vernal) | 9 = Decumbent (Norseman) | |

3. RECOVERY AFTER FIRST SPRING CUT (In Southwest, first cut after March 21):

5

- | | | | |
|--------------------------|--------------------|---------------------------|-------------------|
| 1 = Very Fast (CUF 101) | 3 = Fast (Saranac) | 5 = Intermediate (Ranger) | 7 = Slow (Vernal) |
| 9 = Very Slow (Norseman) | | | |

TEST LOCATION: MI, IA, PA, WI, WA, IL, NY

4. AREAS OF ADAPTATION IN U.S. (Where tested and proven adapted):

1

Primary Area of Adaptation

2

6

Other Areas of Adaptation

- | | | | |
|--|-------------------------------|------------------|---------------|
| 1 = North Central | 2 = East Central | 3 = Southeast | 4 = Southwest |
| 5 = Moderately Winterhardy Intermountain | 6 = Winterhardy Intermountain | 7 = Great Plains | |
| 8 = Other (Specify) _____ | | | |



5. FLOWERING DATE (When 10% of plants possess open flowers at time of first spring cut):

<input type="text"/> Days Earlier Than	<input type="text"/>
Same As	<input type="text"/>
<input type="text"/> Days Later Than	<input type="text"/>

- | | | | | |
|-------------|-------------|-------------|------------|--------------|
| 1 = CUF 101 | 2 = Mesilla | 3 = Saranac | 4 = Vernal | 5 = Norseman |
|-------------|-------------|-------------|------------|--------------|

TEST LOCATION: _____

6. PLANT COLOR (Determined from healthy regrowth 3 weeks after first spring cut, controlling leafhoppers if necessary).

☐

1 - Very Dark Green (524)

2 - Dark Green (Vernal)

3 - Light Green (Ranger)

COLOR CHART VALUE (Specify chart used):

APPLICATION VARIETY:

VERNAL:

TEST LOCATION:

7. CROWN TYPE (Determined from spaced plantings):

☐

Noncreeping Types:

1 - Broad (Vernal)

2 - Intermediate (Saranac)

3 - Narrow (CUF 101)

Creeping Types:

4 - Creeping Rooted (Rangefander)

5 - Rhizomatous (Rhizoma)

8. FLOWER COLOR (Determine frequency of plants for each color class as defined by USDA Agricultural Handbook No. 424 (Barnes 1972), allowing all plants in plot to flower):

☐

6 7

% Purple and Violet (Subclasses 1.1 to 1.4)

☐

0 8

% Blue (Subclasses 2.3 and 2.4)

☐

2 3

% Variegated Other Than Blue (Subclasses 2.1, 2.2, 2.5 to 2.9)

☐

0 2

% Yellow (Subclasses 4.1 to 4.4)

☐

T

% Cream (Class 3)

☐

T

% White (Class 5)

TEST LOCATION: Connell, WA

9. POD SHAPE (Determine frequency of plants with the following pod shapes produced on well cross-pollinated racemes):

☐

T

% Tightly Coiled (One or more coils, center more or less closed)

☐

L

% Loosely Coiled (One or more coils, center conspicuously open)

☐

S

% Sickle (Less than 1 coil)

TEST LOCATION:

10. PEST RESISTANCE: Provide in the appropriate column, trial data for application variety, and resistant (R) and susceptible (S) check varieties, synthetic generation tested, average severity index scores (ASI), least significant difference statistics (LSD .05), the institution in charge of test, year, and location of test, and whether test is a field or laboratory evaluation. Describe scoring system, and any test procedure which differs from standard methods proposed by Elgin (1982). Trial data from other test years or locations should be presented whenever available on a separate document as Exhibit D. Seeds of the check varieties and germplasm lines listed below can be obtained from the USDA Field Crops Laboratory, Bldg. 001, Rm. 335, BARC-West, Beltsville, MD 20705. Although comparisons with check varieties listed below are preferred, comparisons with any appropriate check variety recommended by Elgin (1982) may be presented.

A. DISEASE RESISTANCE:	DISEASE	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION FIELD OR LABORATORY
Anthracnose, Race 1 (<i>Colletotrichum trifolii</i>)	Application (S)	2	3.5	Approx 250		% resistant plants = 5.9	Pioneer Hi-Bred International, Inc. 1987 Johnston, IA Laboratory	
	Arc (R)		72.3	Approx 250				
	Saranac (S)		1.0	Approx 250				
	SCORING SYSTEM: % surviving seedlings							
Anthracnose, Race 2 (<i>Colletotrichum trifolii</i>)	Application							
	Saranac AR (R)							
	Arc (S)							
	SCORING SYSTEM:							
Bacterial Wilt (<i>Corynebacterium insidiosum</i>)	Application (HR)	1	56.61	Approx 225	1.67	0.5	University of Minnesota 1987 Rosemount, MN Field	
	Vernal (R)		42.60	Approx 225	2.22			
	Narragansett (S)		5.82	Approx 225	3.45			
	SCORING SYSTEM: Plants scored 0 and 1 (on a 0-5 scale where 0=no disease and 5=dead plant) considered resistant. Data adjusted to Vernal at 42% resistant							
Common Leafspot (<i>Pseudopeziza medicaginis</i>)	plants by the University of Minnesota							
	Application							
	MSA-CW3AN3 (R)							
	Ranger (S)							
SCORING SYSTEM:								

DISEASE	VARIETY	TESTED	PERCENT PLANTS	PLANTS TESTED	ASI	LSD .05	FIELD OR LABORATORY
Downy Mildew (<i>Peronospora trifoliorum</i>)	Application						
	Saranac (R)						
	Kanza (S)						
	SCORING SYSTEM:						
Fusarium Wilt (<i>Fusarium oxysporum</i> f. <i>medicaginis</i>)	Application (MR)	1	24.32	Approx 225	3.63	0.77	University of Minnesota 1987 Rosemount, MN Field
	Meeker (R)		54.00	Approx 225	2.41		
	Narragansett (R) LR		22.06	Approx 225	3.68		
	SCORING SYSTEM: Plants scored 0 and 1 (on a 0-5 scale, where 0=no disease and 5=dead plant) considered resistant. Data adjusted to Agate at 54% resistant plants by the University of Minnesota.						
Phytophthora Root Rot (<i>Phytophthora megasperma</i> f. <i>medicaginis</i>)	Application (R)	1	47.30	Approx 225	2.89	0.75	University of Minnesota 1987 St. Paul, MN Field
	Agate (R)		43.00	Approx 225	2.90		
	Saranac (S)		16.69	Approx 225	4.42		
	SCORING SYSTEM: Plants scored 1 and 2 (on a 1-6 scale, where 1=no disease and 6=dead plant) considered resistant. Data adjusted to Agate at 43% resistant plants by the University of Minnesota.						
Verticillium Wilt (<i>Verticillium albostrum</i>)	Application (LR)	2	17.0	-	3.47	% resis- tant plants = 9.38 ASI = 0.42	University of Wisconsin 1987 Madison, WI Laboratory
	Vertus (R)		41.0	-	2.60		
	Saranac (S)		8.6	-	3.88		
	SCORING SYSTEM: Plants scored 1 and 2 (on a 1-5 scale, where 1=no disease and 5=dead plant) considered resistant. Data adjusted to Vertus at 41% resistant plants by Pioneer Hi-Bred International, Inc.						
Other (Specify)	Application						
	(R)						
	(S)						
	SCORING SYSTEM:						
Other (Specify)	Application						
	(R)						
	(S)						
	SCORING SYSTEM:						
B. INSECT RESISTANCE:							
INSECT	VARIETY	SYN. GEN. TESTED	PERCENT DEFOLIATION	DEFOLIATION IN PERCENT OF RESISTANT CHECK	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Aalfs Weevil (<i>Hypera postica</i>)	Application						
	Arc (R)			100			
	Saranac (S)						
	SCORING SYSTEM:						

10. B. INSECT RESISTANCE (Continued):

INSECT	VARIETY	SYN. GEN. TESTED	PERCENT SEEDLING SURVIVAL	NUMBER OF SEEDLINGS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Blue Alfalfa Aphid (<i>Acyrtosiphon kondoi</i>)	Application						
	CUF 101 (R)						
	PA-1 (S)						
	SCORING SYSTEM:						
Pea Aphid (<i>Acyrtosiphon pisum</i>)	Application (R)	1	46.3	Approx 300	3.6	% resis- tant plants 17.9 ASI 0.48	Pioneer Hi-Bred International, Inc. 1987 Johnston, IA Laboratory
	Konza (R) Baker (R)		70.0	"	3.9		
	Kanza (R)		24.0	"	2.9		
	Ranger (S)		8.6	"	2.3		
SCORING SYSTEM: Plants scored 5-9 (on a 1-9 scale where 9=no symptoms and 1=dead or severe stunting) considered resistant. Data adjusted to Baker at 70% by Pioneer Hi-Bred International, Inc.							
Spotted Alfalfa Aphid (<i>Therioaphis maculata</i>) Biotype, if known:	Application (R)	1	58.4	Approx 300	2.34	% resis- tant plants 25.5 ASI 0.62	Pioneer Hi-Bred International, Inc. 1987 Fresno, CA Laboratory
	Konza (R) Baker (R)		70.0	"	2.66		
	Ranger (S)		13.1	"	1.37		
	SCORING SYSTEM: Plants scored 7-9 (on a 1-9 scale where 9=no symptoms and 1=dead or severe stunting) considered resistant. Data adjusted to Baker at 70% resistant plants by Pioneer Hi-Bred International, Inc.						
INSECT	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Potato Leafhopper Yellowing (<i>Empoasca fabae</i>)	Application						
	MSA-CW3An3 (R)						
	Ranger (S)						
	SCORING SYSTEM:						
Other (Specify)	Application						
	(R)						
	(S)						
	SCORING SYSTEM:						
C. NEMATODE RESISTANCE:							
NEMATODE	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION, FIELD OR LABORATORY
Northern Root Knot (<i>Meloidogyne hapla</i>)	Application						
	Nev. Syn. XX (R)						
	Lahontan (S)						
	SCORING SYSTEM:						

10. C. NEMATODE RESISTANCE (Continued):

NEMATODE	VARIETY	SYN. GEN. TESTED	PERCENT RESISTANT PLANTS	NUMBER OF PLANTS TESTED	ASI	ASI LSD .05	INSTITUTION, YEAR, LOCATION FIELD OR LABORATORY
Southern Root Knot (<i>Meloidogyne incognita</i>)	Application						
	Moapa 69 (R)						
	Lahontan (S)						
	SCORING SYSTEM:						
Stem Nematode (<i>Ditylenchus dipsaci</i>)	Application (MR)	1	26.1	Approx 300	2.80	% Resis- tant plants 11.54 ASI 0.64	Pioneer Hi-Bred International, Inc. 1987 Connell, WA Laboratory
	Lahontan (R)		60.0	"	4.79		
	Ranger (S)		16.8	"	2.52		
	SCORING SYSTEM: Plants scored 7-9 (on a 1-9 scale where 9=no disease and 1=dead plant) considered resistant. Data adjusted to Lahontan at 60% resistant						
Other (Specify)	plants by Pioneer Hi-Bred International, Inc.						
	Application						
	(R)						
	(S)						
SCORING SYSTEM:							

11. INDICATE THE VARIETY THAT MOST CLOSELY RESEMBLES THE APPLICATION VARIETY FOR EACH OF THE FOLLOWING CHARACTERS:

CHARACTER	VARIETY	CHARACTER	VARIETY
Winterhardiness	Vernal	Plant Color	--
Recovery After 1st Cut	532	Crown Type	Vernal
Area of Adaptation	Vernal	Combined Disease Resistance	Agate
Flowering Date	--	Combined Insect Resistance	526

REFERENCES

Barnes, D.K. 1972. A System for Visually Classifying Alfalfa Flower Color. U.S. Dep. Agric. Handb. 424. 18 pp. (Note: Greenish cast of plate 6, A and B is an artifact of printing, actual colors a blend of yellow and white.)

Elgin, J.H., Jr., (ed.). 1982. Standard Tests to Characterize Pest Resistance in Alfalfa Cultivars. U.S. Dep. Agric. Tech. Bull. (In Press).

Gunn, C.R., W.H. Skrdla, and H.C. Spencer. 1978. Classification of *Medicago sativa* L. using legume characters and flower colors. U.S. Dep. Agric. Tech. Bull. 1574. 84 pp.

Munsell Color Co. 1977. Munsell Plant Tissue Color Charts. Munsell Color Co., Inc. Baltimore.

NOTE: Any additional descriptive information and supporting documentation may be provided as Exhibit D.

'5262'

APPLICATION FOR REVIEW OF ALFALFA VARIETIES FOR CERTIFICATION
National Alfalfa Variety Review Board

(The criteria for evaluation of applications were developed by the Joint Alfalfa Work Conference and the Association of Official Seed Certifying Agencies.)

Applicant's Name:

Date: November 20, 1987

Revised: January 14, 1988

Pioneer Hi-Bred International, Inc.

Address:

P. O. Box 287, Johnston, Iowa 50131

Sponsoring Institution (if other than applicant):

Breeder's name (if other than applicant):

Variety Name: 5262

Experimental Designation: XAF62, YAF62,
83SR241, JHF871

The breeder or sponsoring institution or organization must describe and DOCUMENT in this application those characteristics of the variety which give it distinctiveness and merit by supplying the information requested below. Information must be supplied for each category excepting those listed as optional. Action will be deferred unless the application is sufficiently documented.

- I. A. Estimate the % of the germplasm sources listed below that contribute to the major genetic constitution of this variety.

<u>M.falcata</u>	<u>Ladak</u>	<u>M.varia</u>	<u>Turkistan</u>	<u>Flemish</u>	<u>Chilean</u>	
7	8	25	3	49	8	
<u>Peruvian</u>	<u>Indian</u>	<u>African</u>	<u>Arabian</u>	<u>Unknown</u>		

- B. A statement of origin (including variety names, germplasm releases and/or PI numbers, and the number of plants or % contribution from each) and the breeding procedures or methods and selection criteria used in developing the variety. Include the procedure for producing breeder seed, the generation (e.g. Syn 1, Syn 2, etc.) that is considered breeder seed, and the year of breeder seed production.

XAF62 is a synthetic variety comprised from 155 plants originating from experimental lines tracing to Saranac (18%), Vernal (13%), DuPuits, 530, Alfa (11% each), Flemish (9%), Titan, Valor, MnP-B1 (7% each), and Weevlchek (6%). Parent plants were selected through phenotypic recurrent selection and trace to various experimental populations selected for one or more of the following: bacterial wilt, anthracnose, Phytophthora root rot, and winter survival. Syn 1 seed harvested from parental plants in 1983 and 1984 in cage isolations was bulked and considered breeder seed.

- C. Seed classes to be used, limitations on age of stand and areas of production for each class.

Seed Class	Synthetic Generation	Length of Stand Allowed	Limitation on Areas for Seed Production
Breeder	1	Two	None
Foundation	2 or 3	Three	None
Certified	2, 3, or 4	Five	None

Only the synthetic generations given for the above seed classes are recognized as representing this variety. (No supporting data should be used in this application from Syn. generations other than those for the Breeder. Foundation and Certified Classes listed here).

- D. Procedures for maintaining seed stock:

Seed (Syn 1) produced on 155 plants in cage isolation in 1983 and 1984 was bulked and designated breeder seed. Seed classes will be breeder, foundation and certified. Foundation seed may be produced from breeder or foundation. The second generation foundation seed may be produced at the discretion of Pioneer Hi-Bred International, Inc. Both breeder and Foundation seed will be maintained by Pioneer Hi-Bred International, Inc. Certified seed may be produced from breeder or foundation seed.

- E. Any other requirements or limitations necessary to maintain varietal characteristics?

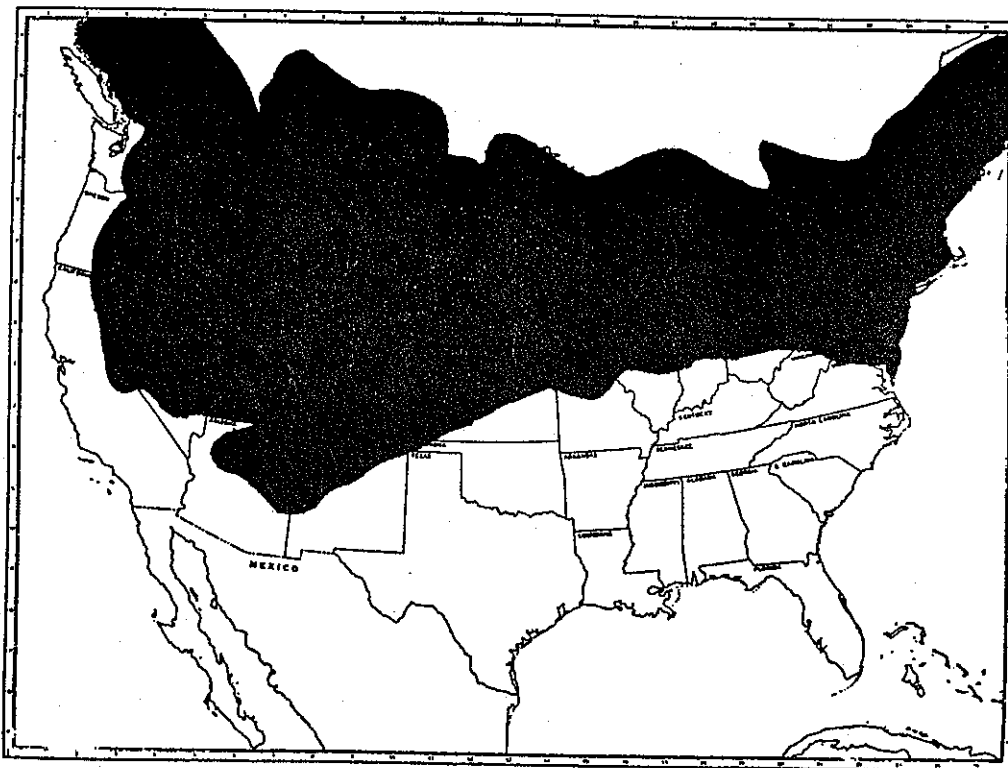
None

- II. A. Describe the primary use of this variety (if for uses other than hay, haylage, greenchop or dehydration):

- B. List states and areas within states where tested for forage and/or persistence. (Present data from each location in IIIA and IIIB.)

Johnston, IA; Toledo, IA; Owatonna, MN; Tipton, IN; Litchfield, MI; Marlette, MI; Phelps, NY; Lancaster, PA; Buckeystown, MD; Hermiston, OR; Connell, WA; Moses Lake, WA; Davis, IL; Arlington, WI; Markesan, WI.

- C. Indicate proposed areas of adaptation and intended use on the map below.



III. Evidence of agronomic performance, including data on yield (in T/A) and persistence. Data may be from tests conducted by private firms, Agricultural Experiment Stations or USDA.

- A. Minimum required forage yield data is six location years with at least two locations (two locations must be at least 100 miles apart). Seeding year forage yield data cannot be used to satisfy this requirement. One location must have at least two harvest years beyond seeding year. Each harvest year should be listed separately.

Note: For non-dormant varieties (dormancy level of Moapa 69 or CUF-101) seeding year data may be accepted for up to two of the six location years when four or more cuttings are made in the seeding year.

Summarize Forage Yield Data below:

Test location	Date Mo/Yr	Syn Gen	Year Hvst	# Cuts	This Variety	Total Yield (DM T/A)			LSD .05	CV%
						2. ^a	3. ^b	4.		
Johnston IA	Summer 84	1	1985	4	7.70	6.81	-		.72	5.9
		1	1986	4	7.39	5.94	-		.57	5.3
	Spring 85	1	1986	4	8.35	6.62	7.18		.81	7.2
		1	1987	4	7.90	5.60	6.28		.71	6.5
Toledo IA	Spring 84	1	1985	4	7.82	5.01	-		.80	6.5
		1	1986	4	6.46	5.10	-		.55	5.4
	Spring 85	1	1986	4	7.25	5.85	6.45		.72	6.6
		1	1987	4	7.67	5.75	6.23		.56	5.0
Owatonna MN	Summer 84	1	1985	4	6.16	5.21	-		.78	8.5
		1	1986	4	7.54	5.26	-		.76	7.2
	Spring 85	1	1986	4	7.16	5.53	6.62		.59	5.4
		1	1987	3	6.72	5.41	5.47		.56	5.8
Tipton IN	Spring 84	1	1985	4	6.83	6.23	-		.65	5.9
		1	1986	3	4.22	3.42	-		.46	7.5
	Spring 85	1	1986	4	5.30	4.49	4.75		.58	6.9
		1	1987	4	5.51	4.71	4.76		.72	8.0
Litch- field, MI	Spring 84	1	1985	3	2.97	3.04	-		.70	12.9
		1	1986	4	7.83	6.70	-		.53	4.2
	Spring 85	1	1986	4	7.08	5.53	6.37		.69	7.1
		1	1987	4	3.88	2.58	3.37		.64	11.6
Marlette MI	Spring 84	1	1985	3	3.94	3.27	-		.89	15.3
		1	1986	4	7.56	6.08	-		.84	7.6
	Spring 85	1	1986	3	4.42	3.87	4.08		.54	7.7
		1	1987	3	2.90	2.64	2.41		.80	17.0
Phelps NY	Spring 84	1	1985	4	5.90	5.19	-		.44	4.6
		1	1986	4	7.67	6.06	-		.61	5.1
	Spring 85	1	1986	4	8.19	7.08	8.03		.72	5.5
		1	1987	4	7.33	5.48	5.68		.89	8.4
Lancas- ter, PA	Spring 84	1	1985	4	6.47	5.31	-		.77	7.7
		1	1986	4	6.33	4.72	-		.84	9.2
	Spring 85	1	1986	4	6.75	6.34	5.87		.82	7.4
		1	1987	5	5.20	4.14	4.09		.77	9.4

Test location	Date Plntd Mo/Yr	Syn Gen	Year	# Cuts	This Variety	Total Yield (DM T/A)			LSD .05	CV%
						2. ^a	3. ^b	4.		
Buckeys- town, MD	Spring 84	1	1985	5	6.92	5.52	-		.80	7.3
		1	1986	4	5.70	4.40	-		.96	11.7
	Spring 85	1	1986	4	5.24	4.86	4.81		.62	7.0
		1	1987	5	6.80	5.41	4.49		.97	9.1
Hermis- ton, OR	Spring 84	1	1985	5	13.07	11.62	-		1.11	5.6
		1	1986	5	12.50	11.52	-		.96	4.8
	Spring 85	1	1986	5	12.80	11.92	12.42		1.11	5.5
		1	1987	3	6.15	5.06	5.98		.93	10.0
Connell WA	Spring 84	1	1985	5	13.11	10.66	-		.95	4.7
		1	1986	5	12.51	10.03	-		.75	3.9
	Spring 85	1	1986	5	13.57	11.35	13.18		.92	4.4
		1	1987	5	12.34	10.77	11.50		1.15	5.9
Moses Lake, WA	Spring 84	1	1985	4	10.76	9.28	-		.87	5.0
		1	1986	4	11.48	10.04	-		1.00	5.5
	Spring 85	1	1986	4	12.54	11.39	12.42		1.02	4.9
		1	1987	4	9.17	7.74	9.08		1.00	6.9
Davis IL	Spring 84	1	1985	4	8.05	6.85	-		.69	5.7
		1	1986	3	8.11	7.25	-		.60	4.7
	Spring 85	1	1986	3	7.15	6.85	7.30		.86	7.1
		1	1987	4	6.77	6.30	5.96		.75	7.0
Arling- ton, WI	Spring 84	1	1985	5	8.02	6.52	-		1.14	9.3
		1	1986	4	6.47	5.20	-		.77	7.8
	Spring 85	1	1986	4	7.94	6.62	7.20		1.02	8.6
		1	1987	4	6.72	5.38	5.32		.83	8.4
Markesan WI	Spring 85	1	1986	4	7.67	6.57	6.86		.87	7.4
		1	1987	4	5.23	4.32	3.98		.79	10.2

Mean Annual Yield

	Years Hvstd	Total # of Hvsts			
Ck 2 comparison	58	231	7.61	6.35	X
Ck 3 comparison	30	120	7.39	X	6.60
Ck 4 comparison					

^a Vernal
^b Saranac

- B. Persistence (winter and drought tolerance, summer survival relative to check varieties). Enter dates of both initial and Final stand estimates. Data must come from the area of adaptation and from stands at least two years old. More than one location must be given either when persistence is a trait used to justify release or when large diverse geographic areas of adaptation are recommended.

Test Location	Syn Gen	Date Seeded	Yrs. Hvtd	No. Hvts	Date of Readings Init/Final	This Variety In/Fnl	% Stand Check varieties		LSD .05	CV %
							^a In/Fnl	^b In/Fnl		
ZONE I	1	Spg 84	3	10/loc	Sum 84	101	100	-	2.35	2.5
					Fall 86	103	101	-	3.71	4.0
ZONE I	1	Spg 85	3	10/loc	Sum 85	100	98	99	1.32	1.4
					Fall 87	108	99	99	7.66	8.3
ZONE II	1	Spg 84	3	10/loc	Sum 84	101	100	-	2.26	2.5
					Fall 86	102	101	-	4.41	4.8
ZONE II	1	Spg 85	3	10/loc	Sum 85	103	101	101	3.37	3.6
					Fall 87	104	98	100	5.22	4.6
ZONE III	1	Spg 84	3	10/loc	Spg 85	101	98	-	2.42	2.6
					Fall 86	103	93	-	3.29	3.6
ZONE III	1	Spg 85	3	12/loc	Spg 86	99	100	100	1.50	1.6
					Fall 87	103	91	79	4.03	4.4
ZONE IV	1	Spg 84	3	14/loc	Sum 85	101	98	-	3.14	3.4
					Fall 86	100	99	-	2.96	3.2
ZONE IV	1	Spg 85	3	14/loc	Sum 84	100	101	101	4.57	7.0
					Fall 87	103	101	105	10.06	10.9
ZONE V	1	Spg 84	3	10/loc	Sum 84	100	101	-	2.48	2.2
					Fall 86	103	98	-	6.01	5.3
ZONE V	1	Spg 85	3	10/loc	Sum 85	101	98	102	4.92	5.3
					Fall 87	108	99	99	7.66	8.3

Scoring system used: Data taken as missing six inch units within each plot with total plot size = 120 units. Data is in % of mean from a zone means AOV.

ZONE I (1984, 1985) = Johnston, IA; Owatonna, MN; Toledo, IA

ZONE II (1984, 1985) = Litchfield, MI; Marlette, MI; Tipton, IN

ZONE III (1984, 1985) = Lancaster, PA; Buckeystown, MD; Phelps, NY

ZONE IV (1984, 1985) = Hermiston, OR; Connell, WA; Moses Lake, WA

ZONE V (1984) = Davis, IL; Arlington, WI

ZONE V (1985) = Davis, IL; Arlington, WI; Markeson, WI

^a Vernal
^b Saranac

WINTERHARDINESS

Test conducted by Pioneer Hi-Bred International, Inc. at Owatonna, MN

Variety	Class	Year Tested	Syn. Gen.	Percent Survival
This variety	Hardy	1984-85	1	48.2
1. Vernal	Hardy			58.9
2. 526	Hardy			41.6
3. Saranac	Moderately Hardy			15.0
4. 555	Low Hardy			4.9
L.S.D.	(.05)			12.6
	(.01)			
C.V.	(%)			35.7

Scoring system used: Plots seeded in 25' rows with six replications. Plots were hand thinned to leave plants spaced 1' apart (25 plants per/plot). Date of last harvest = 9/4/84 with surviving plants counted the following spring.

WINTERHARDINESS

Test conducted by Pioneer Hi-Bred International, Inc. at Owatonna, MN

Variety	Class	Year Tested	Syn. Gen.	Percent Survival
This variety	Hardy	1985-86	1	54.3
1. Vernal	Hardy			59.2
2. 526	Hardy			65.5
3. Saranac	Moderately Hardy			32.4
4. 555	Low Hardy			18.8
L.S.D.	(.05)			11.7
	(.01)			
C.V.	(%)			25.0

Scoring system used: Plots seeded in 25' rows with six replications. Plots were hand thinned to leave plants spaced 1' apart (25 plants per/plot). Date of last harvest = 10/2/85 with surviving plants counted the following spring.

C. Fall dormancy relative to recognized varieties

1. Test data

Test Location	Syn Gen	Date Last Cut	Date Measures	Score or average height			LSD .05	CV %
				This Variety	check varieties 1. a	2. b		
*Owatonna MN	1	8/28/85	10/2/85	29.3	26.3	30.2	32.0	1.9 5.0
*Owatonna MN	1	9/4/84	10/2/84	7.9	7.9	8.6	9.1	.76 7.5
**Exp. 1 Moses Lake WA	1	9/25/86	10/16/86	13.0	11.0	-	19.0	4.7 18.0
**Exp. 2 Moses Lake WA	1	9/15/86	10/16/86	16.0	13.0	-	22.0	4.8 14.0

Scoring system used: *Average height in CM of space plants; 25 plants per rep; 6 replications
 **Average height of plot in CM; 3 replications

a Vernal
 b Ranger
 c Saranac

2. Indicate which of the following check varieties this variety most nearly compares to in fall dormancy.

VERY DORMANT	DORMANT	MOD. DORMANT	NON-DORMANT	VERY NON-DORMANT
Norseman ()	Vernal (X) Ranger ()	Saranac () DuPuits () Mesilla ()	Moapa 69 ()	CUF 101 ()

D. Seed production (this information optional)

Variety	Syn Gen	Test Location	Yrs. Tested	Average Yield (lbs/A)
This variety	No information			
1.				
2.				

IV. Other description characteristics

- A. Flower color at full bloom. Syn generation observed 2
(see USDA Agr. Handbook No. 424 - A system for visually
classifying alfalfa flower color).

<u>67</u> % purple	<u>T</u> % cream	<u>2</u> % yellow
<u>31</u> % variegated	<u>T</u> % white	

- B. Growth habit: (erect, semi-erect or decumbent)

Mid summer	<u>Erect</u>
Fall	<u>Semi-erect</u>

- C. Optional: (Document distinctive characteristics such as
pod, leaf or root traits, biochemical markers, etc.)

V. Pest Resistance Characteristics

Please follow these instructions carefully when reporting pest
resistance results.

Furnish comparative data on the following insects and diseases (and others where applicable) for your variety. Data may be from tests conducted by private firms, Agricultural Experiment Stations, or USDA. Tests should be conducted by standard procedures as described in ARS Misc. publication 1434. Each disease and insect test must include recognized resistant and susceptible checks. Resistance levels should be characterized using % resistant plants as follows: S=<6%, LR=6-14%, MR=15-30%, R=31-50%, HR=>50%. Do not refer to tolerance. Checks should be characterized based on long term % resistance averages published in ARS Misc. publication 1434. If data for the resistant check does not fit its expected resistance class (MR, R, HR, etc.) data must be adjusted to the long term mean. If data has been adjusted, supply both adjusted and unadjusted values and indicate how and by whom the adjustment was made. If a scoring or rating system is used, specify the limits and meaning of scores. Pest resistance data must be submitted on at least four of the following nine pests: anthracnose, bacterial wilt, Fusarium wilt, Verticillium wilt, Phytophthora root rot, stem nematode, pea aphid, spotted alfalfa aphid, and blue alfalfa aphid. For the pests where no data is available write "Not tested". The four required pests must be selected from those that frequently cause significant losses on susceptible cultivars in the area of proposed adaptation of this variety. (Use the map you have shaded in IIC and compare with the maps of distribution and severity of alfalfa pests in ARS Misc. publication 1434. This will determine for which pests you must submit resistance information.) Show generation of seed used for each test.

ANTHRACNOSE (Race 1)

Test conducted by _____ at _____

Variety	Resistance class	Year Tested	Syn. Gen.	Unadjust. % R	Adjust. % R	Score or A.S.I.
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This variety _____ Not adequately tested

1.

2.

3.

L.S.D. (.05)

(.01)

C.V. (%)

Scoring system used: _____

BACTERIAL WILT

Test conducted by Pioneer Hi-Bred International, Inc. at Arlington, WI

Variety	Resistance class	Year Tested	Syn. Gen.	Unadjust. % R	Adjust. % R	Score or A.S.I.
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This variety HR 1987 1 33.74 62.93 5.0

1. Vernal R 22.93 42.00 4.5

2. Narragansett S 1.27 2.33 2.8

3. L.S.D. (.05) 20.53 0.63

(.01)

C.V. (%) 23.0 8.0

Scoring system used: Plants scored 7-9 (on a 1-9 scale, where 9=no disease, and 1=dead plant) considered resistant. Data adjusted to Vernal at 42% resistant plants by Pioneer Hi-Bred International, Inc.

BACTERIAL WILT

Test conducted by University of Minnesota at Rosemount, MN

Variety	Resistance class	Year Tested	Syn. Gen.	Unadjust. % R	Adjust. % R	Score or A.S.I.
This variety	HR	1987	1	54.40	56.61	1.67
1. Vernal	R			40.37	42.00	2.22
2. Ranger	MR			22.37	23.28	2.55
3. Narragansett	S			5.59	5.82	3.45
L.S.D.	(.05)					0.50
	(.01)					
C.V.	(%)					14.34

Scoring system used: Plants scored 0 and 1 (on a 0-5 scale, where 0=no disease, and 5=dead plant) considered resistant.
Data adjusted to Vernal at 42% resistant plants by University of Minnesota.

FUSARIUM WILT

Test conducted by University of Minnesota at Rosemount, MN

Variety	Resistance class	Year Tested	Syn. Gen.	Unadjust. % R	Adjust. % R	Score or A.S.I.
This variety	MR	1987	1	25.15	24.32	3.63
1. Agate	R			55.83	54.00	2.41
2. MNGN-1	S			0.95	0.92	4.90
3. Narragansett	LR			22.82	22.06	3.68
L.S.D.	(.05)					0.77
	(.01)					
C.V.	(%)					19.38

Scoring system used: Plants scored 0 and 1 (on a 0-5 scale, where 0=no disease, and 5=dead plant) considered resistant.
Data adjusted to Agate at 54% resistant plants by University of Minnesota.

FUSARIUM WILT

Test conducted by Pioneer Hi-Bred International, Inc. at Quarryville, PA

Variety	Resistance class	Year Tested	Syn. Gen.	Unadjust. % R	Adjust. % R	Score or A.S.I.
This variety	MR	1987	1	25.8	32.0	3.82
1. Agate	R			43.4	54.0	5.25
2. Narragansett	LR			26.4	32.8	4.15
3. MNGN-1	S			10.3	12.8	2.50
L.S.D.	(.05)			13.6	16.9	0.58
	(.01)					
C.V.	(%)			25.8	25.8	7.70

Scoring system used: Plants scored 7-9 (on a 1-9 scale, where 9=no disease, and 1=dead plant) considered resistant.
Data adjusted to Agate at 54% resistant plants by Pioneer Hi-Bred International, Inc.

VERTICILLIUM WILT

Test conducted by University of Wisconsin at Madison, WI

Variety	Resistance class	Year Tested	Syn. Gen.	Unadjust. % R	Adjust. % R	Score or A.S.I.
This variety	LR	1987	2	21.7	17.0	3.47
1. Vertus	R			52.4	41.0	2.60
2. Saranac	S			11.0	8.6	3.88
3.						
L.S.D.	(.05)			12.0	9.38	.42
	(.01)					
C.V.	(%)			21.4	21.4	10.7

Scoring system used: Plants scored 1 and 2 (on a 1-5 scale, where 1=no disease, and 5=dead plant) considered resistant.
Data adjusted to Vertus at 41% resistant plants by Pioneer Hi-Bred International, Inc.

VERTICILLIUM WILT

Test conducted by Pioneer Hi-Bred International, Inc. at Connell, WA

Variety	Resistance class	Year Tested	Syn. Gen.	Unadjust. % R	Adjust. % R	Score or A.S.I.
This variety	LR	1985	1	11.0		2.9
1. Vertus	R			33.0		4.8
2. Saranac	S			8.0		2.4
3. Vernema	R			15.0		3.4
L.S.D.	(.05)			9.7		0.8
	(.01)					
C.V.	(%)			32.0		12.0

Scoring system used: Plants scored 7-9 (on a 1-9 scale, where 9=no disease, and 1=dead plant) considered resistant.

VERTICILLIUM WILT

Test conducted by Pioneer Hi-Bred International, Inc. at Arlington, WI

Variety	Resistance class	Year Tested	Syn. Gen.	Unadjust. % R	Adjust. % R	Score or A.S.I.
This variety	LR	1987	1	18.80		3.72
1. 5444	HR			44.21		5.40
2. Saranac	R			7.73		2.92
3.						
L.S.D.	(.05)			10.6		0.84
	(.01)					
C.V.	(%)			36.0		14.0

Scoring system used: Plants scored 7-9 (on a 1-9 scale, where 9=no disease, and 1=dead plant) considered resistant.

PHYTOPHTHORA ROOT ROT

Test conducted by University of Minnesota at St. Paul, MN

Variety	Resistance class	Year Tested	Syn. Gen.	Unadjust. % R	Adjust. % R	Score or A.S.I.
This variety	R	1987	1	56.19	42.75	3.09
1. Agate	R			56.52	43.00	2.90
2. Saranac	S			21.93	16.69	4.42
3.						
L.S.D.	(.05)					0.75
C.V.	(%)					17.60

Scoring system used: Plants scored 1 and 2 (on a 1-6 scale, where 1=no disease, and 6=dead plant) considered resistant.
Data adjusted to 43% resistant plants by University of Minnesota.

PHYTOPHTHORA ROOT ROT

Test conducted by University of Minnesota at St. Paul, MN

Variety	Resistance class	Year Tested	Syn. Gen.	Unadjust. % R	Adjust. % R	Score or A.S.I.
This variety	R	1987	1	48.91	37.21	2.97
1. Agate	R			56.52	43.00	2.90
2. Saranac	S			21.93	16.69	4.42
3.						
L.S.D.	(.05)					0.75
C.V.	(%)					17.60

Scoring system used: Plants scored 1 and 2 (on a 1-6 scale, where 1=no disease, and 6=dead plant) considered resistant.
Data adjusted to 43% resistant plants by University of Minnesota.

PHYTOPHTHORA ROOT ROT

Test conducted by University of Minnesota at St. Paul, MN

Variety	Resistance class	Year Tested	Syn. Gen.	Unadjust. % R	Adjust. % R	Score or A.S.I.
This variety	R	1987	1	62.18	47.30	2.89
1. Agate	R			56.52	43.00	2.90
2. Saranac	S			21.93	16.69	4.42
3.						
L.S.D.	(.05)					0.75
	(.01)					
C.V.	(%)					17.60

Scoring system used: Plants scored 1 and 2 (on a 1-6 scale, where 1=no disease, and 6=dead plant) considered resistant.
Data adjusted to 43% resistant plants by University of Minnesota.

PHYTOPHTHORA ROOT ROT

Test conducted by Pioneer Hi-Bred International, Inc. at Arlington, WI

Variety	Resistance class	Year Tested	Syn. Gen.	Unadjust. % R	Adjust. % R	Score or A.S.I.
This variety	R	1987	1	29.06	47.47	4.1
1. Agate	R			26.32	43.00	3.8
2. Saranac	S			2.38	3.89	1.4
3.						
L.S.D.	(.05)			12.3	20.1	1.14
	(.01)					
C.V.	(%)			59.5	59.5	27.7

Scoring system used: Plants scored 7-9 (on a 1-9 scale, where 9=no disease, and 1=dead plant) considered resistant.
Data adjusted to Agate at 43% resistant plants by Pioneer Hi-Bred International, Inc.

PHYTOPHTHORA ROOT ROT

Test conducted by Pioneer Hi-Bred International, Inc. at Johnston, IA

Variety	Resistance class	Year Tested	Syn. Gen.	Unadjust. % R	Adjust. % R	Score or A.S.I.
This variety	R	1987	1	47.3	65.9	6.0
1. Agate	R			30.9	43.0	5.5
2. Saranac	S			3.8	5.3	3.6
3.						
L.S.D.	(.05)			14.4	20.0	0.77
C.V.	(%)			35.0	35.0	10.0

Scoring system used: Plants scored 7-9 (on a 1-9 scale, where 9=no disease, and 1=dead plant) considered resistant.
Data adjusted to Agate at 43% resistant plants by Pioneer Hi-Bred International, Inc.

PHYTOPHTHORA ROOT ROT

Test conducted by Pioneer Hi-Bred International, Inc. at Johnston, IA

Variety	Resistance class	Year Tested	Syn. Gen.	Unadjust. % R	Adjust. % R	Score or A.S.I.
This variety	R	1985	1	51.1		5.9
1. Agate	R			49.7		5.7
2. Saranac	S			2.2		2.5
3.						
L.S.D.	(.05)			15.5		1.0
C.V.	(%)			37.0		14.0

Scoring system used: Plants scored 7-9 (on a 1-9 scale, where 9=no disease and 1=dead plant) considered resistant.

STEM NEMATODE

Test conducted by Pioneer Hi-Bred International, Inc. at Connell, WA

Variety	Resistance class	Year Tested	Syn. Gen.	Unadjust. % R	Adjust. % R	Score or A.S.I.
This variety	MR	1986	1	18.6		2.58
1. Lahontan	R			49.2		3.66
2. Ranger	S			17.1		2.45
3. Vernal	S			9.1		1.83
4. Vernema	R			64.2		3.95
5. WL316	R			37.6		3.31
L.S.D.	(.05)			12.5		0.68
	(.01)					
C.V.	(%)			37.0		16.0

Scoring system used: Plants scored 7-9 (on a 1-9 scale, where 9=no disease, and 1=dead plant) considered resistant.

STEM NEMATODE

Test conducted by Pioneer Hi-Bred International, Inc. at Connell, WA

Variety	Resistance class	Year Tested	Syn. Gen.	Unadjust. % R	Adjust. % R	Score or A.S.I.
This variety	MR	1987	1	17.1		2.80
1. Lahontan	R			39.3		4.79
2. Ranger	S			11.0		2.52
3. Vernema	R			47.7		5.30
4. WL316	R			33.7		3.90
L.S.D.	(.05)			7.56		0.64
	(.01)					
C.V.	(%)			25.0		13.0

Scoring system used: Plants scored 7-9 (on a 1-9 scale, where 9=no disease, and 1=dead plant) considered resistant.

STEM NEMATODE

Test conducted by Pioneer Hi-Bred International, Inc. at Fresno, CA

Variety	Resistance class	Year Tested	Syn. Gen.	Unadjust. % R	Adjust. % R	Score or A.S.I.
This variety	MR	1986	1	7.0	18.9	1.42
1. Lahontan	R			22.0	60.0	2.46
2. Ranger	S			3.0	9.1	1.24
3. Ranger(2)	S			1.0	3.7	1.13
L.S.D.	(.05)			7.0	19.6	0.4
	(.01)					
C.V.	(%)			67.0	67.0	16.0

Scoring system used: Plants scored 7-9 (on a 1-9 scale, where 9=no disease, and 1=dead plant) considered resistant. Data adjusted to Lahontan at 60% resistant plants by Pioneer Hi-Bred International, Inc.

PEA APHID

Test conducted Pioneer Hi-Bred International, Inc. at Johnston, IA

Variety	Resistance class	Year Tested	Syn. Gen.	Unadjust. % R	Adjust. % R	Score or A.S.I.
This variety	R	1987	1	30.2	46.3	3.6
1. Baker	R			45.7	70.0	3.9
2. Kanza	R			15.7	24.0	2.9
3. Ranger	S			5.6	8.6	2.3
4. Vernal	S			0.0	0.0	1.3
L.S.D.	(.05)			11.7	17.9	0.48
	(.01)					
C.V.	(%)			24.0	24.0	8.0

Scoring system used: Plants scored 5-9 (on a 1-9 scale, where 9=no symptoms and 1=dead or severe stunting) considered resistant. Data adjusted to Baker at 70% resistant plants.

SPOTTED ALFALFA APHID

Test conducted by Pioneer Hi-Bred international, Inc. at Fresno, CA

Variety	Resistance class	Year Tested	Syn. Gen.	Unadjust. % R	Adjust. % R	Score or A.S.I.
This variety	R	1987	1	20.3	84.7	2.5
1. Baker	R			16.8	70.0	2.2
2. Ranger	S			0.8	3.2	1.1
3.						
L.S.D.	(.05)			9.6	40.1	0.48
	(.01)					
C.V..	(%)			23.0	23.0	11.0

Scoring system used: Plants scored 7-9 (on a 1-9 scale, where 9=no symptoms and 1=dead or severe stunting) considered resistant. Data adjusted to Baker at 70% resistant plants.

SPOTTED ALFALFA APHID

Test conducted by Pioneer Hi-Bred International, Inc. at Fresno, CA

Variety	Resistance class	Year Tested	Syn. Gen.	Unadjust. % R	Adjust. % R	Score or A.S.I.
This variety	R	1987	1	19.9	64.7	2.3
1. Baker	R			21.5	70.0	2.5
2. Ranger	S			3.9	12.6	1.2
3.						
L.S.D.	(.05)			9.4	30.5	0.53
	(.01)					
C.V..	(%)			22.0	22.0	12.0

Scoring system used: Plants scored 7-9 (on a 1-9 scale, where 9=no symptoms, and 1=dead or severe stunting) considered resistant. Data adjusted to Baker at 70% resistant plants.

SPOTTED ALFALFA APHID

Test conducted by Pioneer Hi-Bred International, Inc. at Fresno, CA

Variety	Resistance class	Year Tested	Syn. Gen.	Unadjust. % R	Adjust. % R	Score or A.S.I.
This variety	R	1987	1	22.2	58.4	2.34
1. Baker	R			26.6	70.0	2.66
2. Ranger	S			5.0	13.1	1.37
3.						
L.S.D.	(.05)			11.2	25.5	0.62
	(.01)					
C.V..	(%)			24.0	24.0	12.0

Scoring system used: Plants scored 7-9 (on a 1-9 scale, where 9=no symptoms, and 1=dead or severe stunting) considered resistant. Data adjusted to Baker at 70% resistant plants.

BLUE ALFALFA APHID

Test conducted by _____ at _____

Variety	Resistance class	Year Tested	Syn. Gen.	Unadjust. % R	Adjust. % R	Score or A.S.I.
This variety	No information					
1.						
2.						
3.						
L.S.D.	(.05)					
	(.01)					
C.V.	(%)					

Scoring system used: _____

- VI. Summarize here the main advantages and characteristics of the variety. (Other than forage and seed yields.)

XAF62 is a winterhardy variety which has high resistance to bacterial wilt; resistance to Phytophthora, pea aphid, and spotted aphid; moderate resistance to Fusarium wilt and stem nematode; and low resistance to Verticillium wilt.

- VII. If this variety is accepted by official certifying agencies, when will certified seed first be offered for sale? _____

Spring, 1989

VIII. Plant Variety Protection

- A. Will application be made for PVP?

Yes ☒ No ☐ Undecided ☐

- B. If yes, will the application specify that the variety is to be sold by variety name only as a class of certified seed?

Yes ☐ No ☒

- IX. As a means of added varietal protection, are you willing to have the information herein turned over to the PVP office?

Yes ☒ No ☐

William T. W. Woodward

Signature of Applicant

At the time a variety is accepted for certification, a seed sample of the generation or generations requested by the certifying agency shall be submitted to the certifying agency by the sponsor. This lot(s) is to be retained as a control sample against which all future seed stocks released for certified seed production may be compared to establish continued trueness of variety.

Varietal Trials OF FARM CROPS

1988 EDITION

Revised December
1987

CONTENTS

FORAGE CROPS

Alfalfa	3
Birdsfoot Trefoil	7
Bromegrass	8
Orchardgrass	8
Red Clover	8
Reed Canarygrass	8
Tall Fescue	9
Timothy	9

GRAIN CROPS

Annual canarygrass	10
Barley	10
Buckwheat	11
Corn	12
Grain Sorghum	13
Millet	14
Oat	14
Wheat, Durum	16
Wheat, Hard Red Spring	17
Wheat, Winter	20
Wild Rice	21
Winter Rye	21

OILSEED CROPS

Flax	23
Mustard, canola, oilseed rape	24
Soybean	26
Sunflower	36

PULSE CROPS

Adzuki	39
Fieldbean	39
Fieldpea, fababean, lupine	43
Lentil	45

PLANTING RATE AND DATE	46
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Table 2. Winterhardness as predicted by fall growth score and disease resistance of alfalfa varieties eligible for certification

Variety	Developer or Marketer ¹	Fall growth (score) ²	RESISTANT PLANTS ³			Anthracnose (rating) ⁴	Verticillium wilt (rating) ⁴
			Bacterial wilt (percent)	Phytophthora root rot (percent)	Fusarium wilt (percent)		
----- highest value best -----							
VERY WINTERHARDY							
Rambler	Agri. Canada ^{SV}	8.0	16	3	25	S	—
Prowler	Pride Seed Co. ^W	7.9	72	2	18	S	—
Ladak	USDA (foreign introduction) ^N	7.5	8	2	29	S	—
Spredor 2	Northrup King Co. ^W	7.5	58	5	24	S	—
Teton	S. Dakota Agr. Exp. Sta. ^{IV}	7.4	15	7	26	S	—
Travois	S. Dakota Agr. Exp. Sta. ^{EINSVYf}	7.4	37	1	15	S	—
Maverick	AgriPro ^g	7.3	42	17	36	S	—
WINTERHARDY							
Wrangler	USDA & Nebraska Agr. Exp. Sta. ^{SUVYbi}	7.0	36	47	42	LR	LR
Victoria	Arkansas Agr. Exp. Sta. ^Z	6.9	5	12	48	S	—
Vernal	Wisconsin Agr. Exp. Sta. & USDA ^{EINSUVYbf}	6.5	42	5	32	S	—
Baker	USDA & Nebraska Agr. Exp. Sta. ^{IVf}	6.5	49	2	36	LR	—
526	Pioneer Hi-Bred International Inc. ^a	6.5	57	8	15	LR	—
636	Garst Seed Co. ^K	6.3	54	54	47	MR	R
Vancor	Northrup King Co. ^W	6.2	56	22	38	R	—
G2818	Funk Seeds Intl. ^J	6.1	58	24	44	LR	—
Agate	USDA & Minnesota Agr. Exp. Sta. ^{ISUVYbf}	6.0	65	43	54	MR	—
Iroquois	Cornell University ^{VYb}	6.0	61	1	22	S	—
Blazer	Land O'Lakes ^E	5.9	49	24	26	LR	LR
629	Garst Seed Co. ^K	5.8	51	31	62	MR	MR
Thunder	AgriPro ^{Ug}	5.7	43	49	55	MR	—
WL 225	W-L Research, Inc. ^N	5.7	61	43	73	MR	R
Phytor	Northrup King Co. ^W	5.5	34	30	39	S	—
Surpass	Cenex/Land O'Lakes ^E	5.5	49	45	46	MR	R
120	DeKalb-Pfizer Genetics ^H	5.5	57	39	20	LR	—
A-54	Ramy Seed Co. ^d	5.4	26	11	25	—	—
Ranger	USDA & Nebraska Agr. Exp. Sta. ^{EINSVf}	5.4	18	4	25	S	—
532	Pioneer Hi-Bred International, Inc. ^a	5.4	63	7	37	MR	—
Dart	AgriPro ^A	5.3	63	62	46	R	R
Milkmaker	Lovelock Seed Co., Inc. ^Q	5.3	43	38	56	MR	—
Polar II	Pride Seed Co. ^W	5.3	57	60	34	S	—
WL 315	W-L Research, Inc. ^N	5.3	66	29	76	MR	MR
MODERATELY WINTERHARDY							
Arrow	AgriPro ^{Ugi}	5.2	57	58	61	MR	R
Big Ten	Premium Seed Co. ^{Fb}	5.2	53	30	48	MR	—
Marathon	Cargill, Inc. ^D	5.2	36	2	13	S	—
Sparta	Cenex Land O'Lakes ^E	5.2	48	20	22	S	—
Apollo	AgriPro ^{Ugi}	5.1	36	36	40	LR	—
Impact	Peterson Seed Co., Inc. ^Z	5.1	65	57	46	MR	R
Oneida	Cornell University ^{Vbi}	5.1	62	52	62	S	—
Centurian	Blue Chip Quality Seed ^c	5.0	57	51	45	R	R
Bell Ringer	Lovelock Seed Co., Inc. ^L	4.9	41	8	27	LR	MR
Salute	United AgriSeeds, Inc. ^{Rh}	4.9	54	34	44	MR	—
Oneida VR	Cornell University ^d	4.8	44	16	55	MR	HR
Ultra	SeedTec Int'l ^{le}	4.8	67	27	58	HR	R
Vernema	USDA & Washington Agr. Exp. Sta. ^{VY}	4.8	21	13	38	S	MR
Elevation	Jacques Seed Co. ^O	4.7	53	42	40	R	MR
Expo	Paymaster Seeds ^D	4.7	37	47	42	MR	—
G7730	Funk Seed Intl. ^{JY}	4.7	55	62	62	LR	—
Magnum	Dairyland Seed Co. Inc. ^G	4.7	51	5	32	MR	—
Perry	USDA & Nebraska Agr. Exp. Sta. ^{SY}	4.7	30	10	38	S	—

EXHIBIT D
ATTACHMENT II
'5262'

8900132

University of Minnesota, "Industry Phytophthora Root Rot Trial"; 1987,
Entry Means Over Four Replicates.

MnNo	Cultivar	Origin	Plants in each class							Adjusted ASI	
			% 1	% 2	% 3	% 4	% 5	% 6	% 1+2		
2892	Agate	Check Var	0.39	56.13	24.71	4.25	1.35	13.17	56.52	43.00	2.90
SCC	Saranac	Check Var	3.11	18.83	21.01	8.52	7.14	41.40	21.93	16.69	4.42
LSD .05 %											.75
CV %											17.60
7131	B3CR252	Pioneer	3.00	32.53	33.20	8.97	1.92	20.38	35.53	27.03	3.35
7132	83SR221	Pioneer	6.76	51.30	15.83	3.89	2.31	19.91	58.06	44.17	3.03
7130	83SR241	Pioneer	10.18	46.01	16.52	1.79	2.63	22.88	56.19	42.75	3.09
7133	JHF871	Pioneer	1.67	47.24	31.23	5.99	0.00	13.87	48.91	37.21	2.97
7134	JHR872	Pioneer	0.00	30.54	36.99	4.62	2.64	25.21	30.54	23.24	3.55
7135	JHR873	Pioneer	1.19	31.65	22.50	10.29	7.41	26.96	32.84	24.99	3.72
7129	XAR 53	Pioneer	5.21	51.51	25.99	9.44	3.21	4.64	56.72	43.16	2.68
7127	YAF 62	Pioneer	7.92	54.26	13.60	5.31	2.50	16.41	62.18	47.30	2.89
7128	YAR 64	Pioneer	6.62	22.40	29.52	1.67	13.55	26.25	29.02	22.08	3.72
7126	YAS 61	Pioneer	12.44	48.55	20.73	0.93	1.79	15.56	60.99	46.40	2.78

YAF62 was a precommercial number for 5262.

EXHIBIT E

STATEMENT OF THE BASIS OF APPLICANT'S OWNERSHIP

'5262'

Pioneer Hi-Bred International, Inc., Des Moines, Iowa, is the employer of the plant breeders involved in the development and evaluation of 5262. Pioneer Hi-Bred International, Inc. has the sole rights and ownership of 5262.